

Jan 4 th. 1949.

- | | | | |
|----------------|--------------------------|--------------------|------|
| 1. W644 x W126 | 14 plates. ca 100/plate. | 16 picked. | 2 H. |
| 2. W660 x W45 | | 26 picked. | 2 H. |
| 3. W595 x W45 | | 2 picked. | |
| 4. W660 x W67 | | 1 " Good yield. | |
| 5. W595 x W17 | | No yield whatever. | |

1: A1, 3	are heterozygous	12 flies probably lac-	1, 2
2: ♀ #7, #12		2 prob. lac -.	3, 4
3. #1 H.			5.
4. - -			

Additional:

- 2): 8 tested All ++
- 3): Two tested Both short. (Salicaria +?)
- 4). 4 tests. 3 - 1++.

Test & purify as lac EMB, L140.

1. Clearly lac heterozygous.
2. " "
3. May be lac heterozygous; colonies pale possibly.
4. ++.
5. Mixture of +, - colonies. Probably not heterozygous, but best sample of + colonies from EM1 lac. ++

January 18, 1991.

streak not as indicated:

402,-1, 2 from mosaic colonies, on Lac, Gal EMB. (note W64Y₁ may be superior for Lac-). H136, 137 (may be heterozygous for Lac+, Lac⁻Gal?)
Gal+

- 3. from a "mosaic +", on all sugars: Lac, Mal, Gal, +, Xyl, Mann.
- 5. from Lac+ on EMB or Lac + +.

⇒ H137 may have some Lac+?

:3. (if cols. identical). H138 Lac, Lac₂.

Lac variable Gal+ (as expected)

Xyl -

Mal -

Ar +

Mann variable.

Note: on lactose, colonies are purplish peripherally - , more sectored in center (●) etc. These colonies tend to fade: almost full + on EMS.

on mannitol, almost all colonies are annular with well defined central region (●); occasionally colonies show sectored.

H136 + 137. have been streaked out on Lac EMB to provide segregants for further study.

January 9, 1949.

- (1) W644 on maltose. This culture was supposed to be galactose negative. When irradiated, it showed many Mal slow. Reinvestigation shows that there are two components in W644
 ① Gal slow Mal- mucoid on galactose.
 ② Gal + Malt+

(2) W660 on galactose. $50 \times 100 = 5000$.
 = W595 Gal+ irradiated.

(3) W656. on arabinose $20 \times 70 = 1400$ 3 mutants:
 Mr. Xyl. Glu. Lac
 W-667 1.
 W-668 2.
 W-669 3.

W670 1.
 671 2.
 672 3.
 673 4.
 674 5.
 675 6.
 676 7.
 677 8 *
 678 9

Mucoid.

Sp. heterozygotes

404

Jan. 12, 1948.

- (1) W45 x W660
(2) W182 x W660 - not.

contaminated = Aerobacter.

26 "+" tested: None heterozygous. 2 $\frac{1}{3}$ - .

Jan. 13, 1949.

Stripping out of mosaic colonies of these cultures gives about 50% mosaics; 50% - . Full + is quite rare.

e.g. 25- : 21+. This is rather lower rate of segregation than shown by previous H stocks.

Pick well isolated - colonies for characterization with T1 and nutritionally. Also pick possible Lac⁺ gene

	T1		T1		T1		T1		
13B A.	R R R S R R R R	1	R R S R S R R	2	R R R S R R	3	R R S R R —	4	R R R S R R
	—		—		—		—		
	R		R		R		R		

H137.	A.	S — R R S —	17	C.	R S R R	7 19
	B.	R R R R R	6	D.	R — R R	8 9

Total: 47R: 9S. Highly abnormal. (non-random).

Test ~~met~~ nutrition of 9S and 9R cultures.

4059.

January 14, 1949.

All lac? - V₁ R

1 +
2 +
3 +
4 +
5 +
6 +
7 +
8 +
9 +
~~10~~ +

Lac? - V₁ S

11 L
12 TL
13 MTL
14 TL
15 MTLB,
16 TL
17 TLB,
18 TLB,
19 TLB,

Keep as W-721.

M+ > M-

T, L ca equal. (linkage to R.S.).

Segregation of 11138

426

Streak out from segregating plate, grossly, to EMB lac.
Rather large proportion of bac + segregants, also bac I.

Mal mutation mrs.

408

Jan, 12, 1948

50 × ca 300 = 15,000 colonies. V87 / Mal EMB.

w	Mal	Sten
1	679	slow +
2	680	- + fades
3		s+ +
4	681	- s.c. +
5		++ +
6	682	- +
7	683	- +
8	684	- ± +
9	685	- +
10	686	s +
11	687	- +
12	688	- s.c. +
13	689	del - +
14	690	± +
15		+ +
16		++ +
17		+ +
18	690	- +
19	691	- +
20	692	- +
21	693	- +
22	694	- +
23	695	- +
24		+ +
25	696	- +
26	697	± +
27	698	- --

regenerations of sp. *Microsporidia*

412.

Jan. 16, 1949.

H138: (Lac; Mem. variable).
sp.
w45 x w660

~~H140:~~ H140: H139 on
LacEMB.
~~LacEMB~~. W 478 x W 595.

Streak out H138 + H140 on LacEMB for stable mosaics.
Pick all isolated cell colonies + or - from individual mosaics and
score on other media.

H138. From lac

Lac Mem. lal

- +

- - - + - - - - - - - - - - - -

- + + + + + + + + + + + + + + + + +

- - - + - - - - - - - - - - - -

- + + + + + + + + + + + + + + + + +

| | | | | | | | | | | | | | | | | |

A

Lac Mem. lal

- + + + + + + + + + + + + + + + + +

- - - + - - - - - - - - - - - -

- + + + + + + + + + + + + + + + + +

B

still
var?
B

Lac Mem. lal

- + + + + + + + + + + + + + + + + +

- - - + - - - - - - - - - - - -

- + + + + + + + + + + + + + + + + +

B

Mem
Lac
Mem

Lac Mem. lal

- - + + + + + + + + + + + + + + + +

- - + + + + + + + + + + + + + + + +

- + + + + + + + + + + + + + + + + +

- - + + + + + + + + + + + + + + + +

- + + + + + + + + + + + + + + + + +

- - + + + + + + + + + + + + + + + +

- + + + + + + + + + + + + + + + + +

- - + + + + + + + + + + + + + + + +

- + + + + + + + + + + + + + + + + +

Lysogenesis of ultrazygotes

412a.

H138 (^{Man}fun₁₀)

lactose Manitol

L M

L M

L M

D

- - - - -

- - - - -

- - - + - -

- - - - -

- - - - -

- - - - -

- - - - -

+ (-+?)

+ (-+?) - -
+ - - - -

E fun₁₁.

+ - - - -

- - - - -

- - + - -

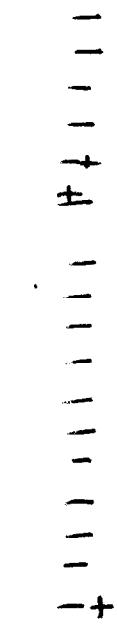
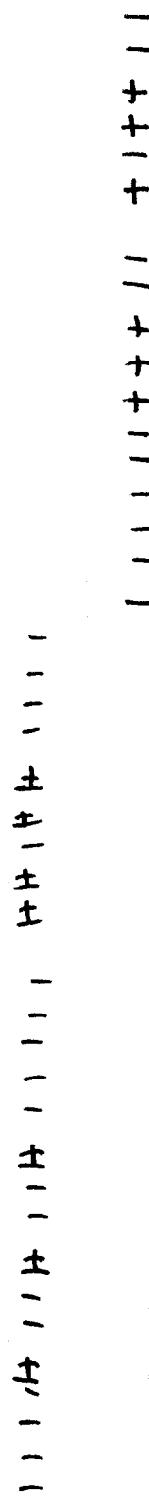
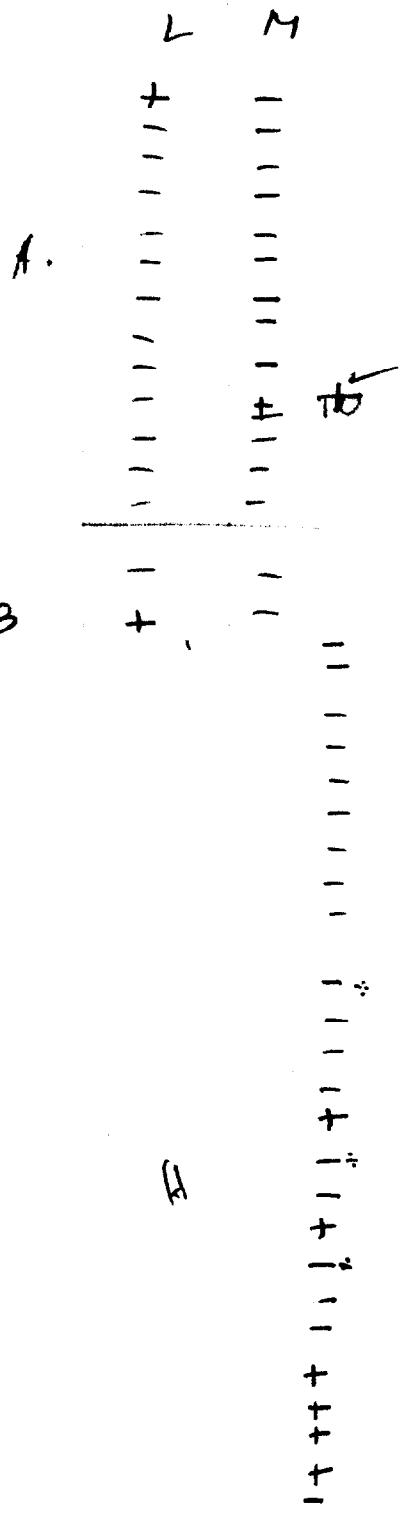
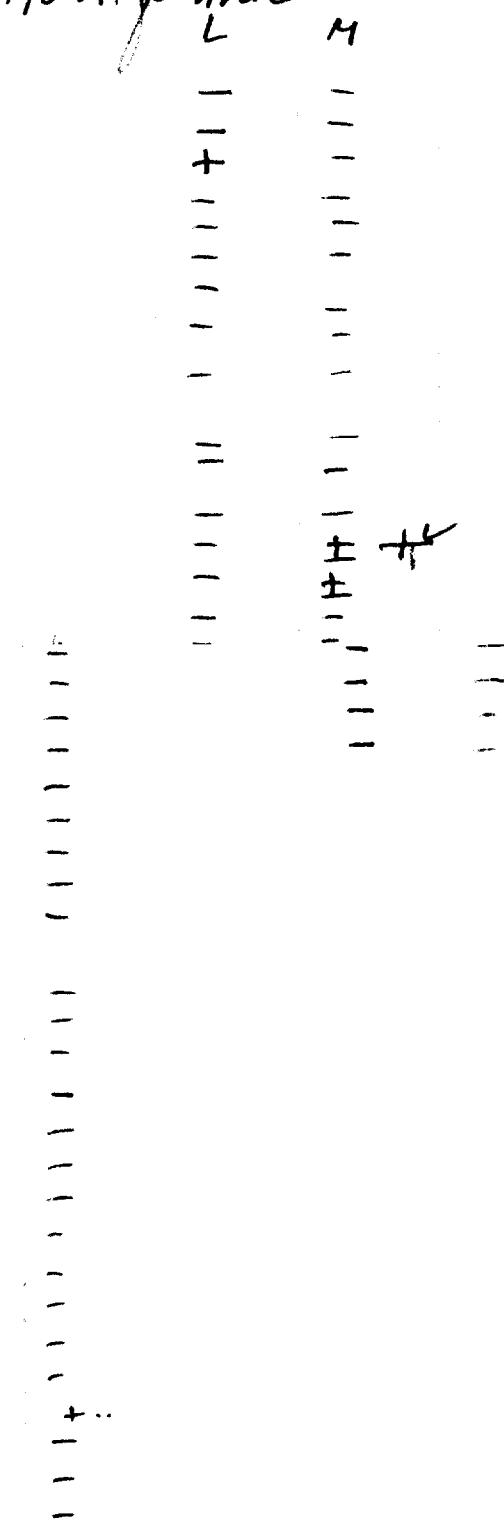
- - - - -

- - - + -

- - - - -

412 b.

140 A / fantac



1/21. Tests on related segregants

| | bac | Htl. | |
|----|------------|------|----------------------------|
| 1 | - | ++ | |
| 2 | - | ++ | |
| 3 | #- | ++ | Pick from Htl var. column. |
| 4 | +? | < | |
| 5 | V or +, -? | - | Recheck on Lac. |
| 6 | V | < | " " |
| 7 | V | < | " " |
| 8 | #+, - v? | - | " " |
| 9 | - | + | |
| 10 | - | + | |

1/22 Rechecks

- 1
2
3
4 Lac variegated (not pure +)
5 Apparently lac+ and lac-. No definite lac^r. Htl for rechecks.
6
7. 1, 2, 4. lac-. 3 lac^r? and lac-. Test with lac^r in E4B lac+ Htl lac+.

No partial segregation. High correlation intra colony. Suggests that sectoring may result from very few segregations per colony. Should try to find evidence for reversal of trend in +/- segregations!

Maltose irradiation cross.

416

1/18/49.

W668. 40 plates E4B14al x ca 400 cols.
16 mutants

W700-715.

6/28/53

Adaptation

W583

Cavalli's data 58-161 x W583

| <u>Gal</u> / <u>lac</u> | + | - | |
|-------------------------|-----|-----|-----|
| + | 43 | 21 | 64 |
| - | 91 | 286 | 377 |
| | 134 | 307 | 441 |

Need V6 rather
than lac to
map Gal.
- - -

Assumed M Gal lac

but too many doubles.

W478 x W583: Xyl, Lacv's isolated

330] Noted that Xylv were mostly "peaking lac -"

Gal doubtless suppressed by Lac ~~suppressor~~ epistases.

330-2 (n EMS lac) mostly Gal+ Mal- Lacv.

340: 58-161 x W583. close Lac, Gal comigration

351: Lac excess. ↩ "

58-161 x W583

273

13

| Lac + | - | |
|-------|-----|-----|
| Gal + | 43 | 21 |
| - | 91 | 286 |
| | | 317 |
| 134 | 307 | 441 |

Gal + Lac + if independent would be $\frac{64}{441} \times 134 \approx \text{about } 20$

Interaction in scoring? Use V_6 .

Mal +

| | | | | |
|-------|----|-----|-----|-----------|
| Gal + | 8 | 53 | 61 | Unlinked. |
| - | 18 | 355 | 373 | |
| | | | 434 | |

Xyl +

Gal +

-

Crosses for heterozygotes

417

1/18/49.

1. W677 x W478 ca¹⁰⁰/plate: No + present.

2. W182 x W677 14 plates 44+ : 150-

3. W45 x W677 15 plates 58+ : 155- P. b. all + and 1 no +
1 mosaic noted

(1) As 20th, quite a few V noted. However, in 40th, somewhere not easily scored.
(medium rather dilute). ? picked for recheck. 1-7

(2) 1? for recheck. lac+

8? Pick mid. "+"
to lac EMS + EMB.

(3) 1? " " lac+ and lac-. var? 9. No var.

H 1/18 1 Mortality +. 1 V? Restreak on lac EMS. Lac Mal lac Mal Xyl Not heterozygous.
1/18 2 Mortality +. 1-. Wait for EMS colonies. not heterozygous.

1/18 3 +, -, V } Restreaks.

1/18 4 +, -, V.

1/18 5 " }

1/18 6 "

1/18 7 +, - and V. 3.

| | | | | | |
|---|----|----|---|---|---|
| X | + | - | + | + | + |
| V | - | -? | + | - | - |
| V | * | - | + | + | + |
| V | V? | - | + | - | + |
| V | - | - | + | - | V |

Additional 100 lac+ colonies streaked from (1). 9 probable V. picked
and restreaked.

H 1/12,
1/18 are
valent

Heterozygotes from W677 x W478.

4179.

| | | <u>lac</u> | <u>Xgl</u> | Mtl | Gal | Mal | Al |
|---|----------------|------------|------------|-----|-----|-----|----|
| 3 | 143 | V | + | + | - | + | + |
| 4 | 144 | V | - | - | -? | - | + |
| 5 | 145 | V | + | + | - | + | + |
| 6 | 146 | V | + | V? | - | - | + |
| 7 | 147 | V | V | - | - | - | + |
| + | 148 | | | | | | |

These are no more satisfactory than ~~H-140~~ H-140 which has already been analysed to some extent. H144 and 147 are useful for getting Mtl+ survivors but cf. H139 (lac, Xgl^V Mtl-)

See 4176 for additional heterozygote in this series.

Heterozygotes from W478 x W677

| | Lac | Xyl | Mtl | Mal | Aral | Gal. |
|---|-----|-----|-----|-------------|-----------------|------|
| 1 | V | V | V? | +
+
" | + v?
" " " " | V |
| 2 | V | V | V? | +
+
" | + v?
" " " " | V |
| 3 | V | - | - | - | ±?
v? | V |
| 4 | V | V | V | - | v?
+ | V |
| 5 | V | - | - | - | v?
+ | V |
| 6 | V | V | V | - | v?
V | V |
| 7 | V | V | V | - | V | V |
| 8 | V | V? | - | - | V | V |

Gal may be regularly variegated in these stocks. May be associated with the Lac.

Second observations:

| | Lac | Xyl | Mtl | Mal | Aral | Gal. | H |
|---------|----------------|---------------------|----------------|-------------|-------------------|---------------------|------------------------|
| 167 1 | V | V ⁺ | V | +
+
+ | + v?
+ v?
+ | V? | 165 |
| 168 2 | V | V ⁺ | V | +
- | + v?
- | V? | 166 |
| 169 3 A | V ⁻ | - | - | - | V?? | V | 167 |
| 170 4 A | V ⁺ | V ⁻ | V ⁻ | - | o v?? | V ⁻ und. | 168 |
| 171 5 | V ⁺ | - | - | - | ? | V? B | 169 See 3/10/49. Pautz |
| 172 6 | V ⁻ | V ⁺ | V | - | ? | V? B | 170 |
| 173 7 | V ⁺ | V ⁺ und. | V | - | | V _B | 171 |
| 174 8 | V ⁺ | V ⁻ und. | - | - | | V | 172 |

almost all
gumming in
galactose

- ① Retest 1/4 colony from all aral + galac segregations.
- ② Retest all ④ segregations.

Jan 28., 1949

H168 is confirmed heterozygous for Lac, Xyl and Htl.

The following tests were made with galactose and lactose:

| | |
|---|-------------------------------------|
| H 165 (1). Probably uniform ^{Gal}
gal | Acab.
slow++ |
| 166 (2) segregating for <u>Gal+</u>
^{Gal S} | slow++ |
| 167 (3) very clearly segregating | " |
| 168 (4) segregating +/s | " |
| 169 (5) segregating +/s | slow++ |
| 170 (6) segregating | slow++, but some radiating colonies |
| 171 (7) segregating ? | slow++ |
| 172 (8) segregating Gal+/s | slow++ |

check by streaking out a slow and a colony separately.

H168: heterozygous for four factors; use for crosses, studies.

1/20/49.

W589 (Luria's tryptophane-adamantine) is not fermentatively normal:

Slow on mannitol, galactose + after 2 days - Maltose - lactose - Glucose ± ++.

1/21

1. Cross with W477 (LB, Lac-). \times W589
2. Y-161 \times W477. (Klebsiella-tryptophane).

Yield of ① very high in 48 hours. Sharp sign. +/-

② less marked yield. Tests:

③ 40 + tested. 5 for retest. 1-5

selects + from "strong" + prototrophs.

④ 28 + tested. 16 probable lac+ 6-21, 26-29

Selects transform "weak" prototrophs.

Overall: 21 V / 68+ or ca 34% in reexamination; or additional 40 are formed from the first group.

⑤ 100 tested. 4 possible mosaics noted. 22-25

None of these is very sharp. Residual on EMS, EM3Lac etc.

In addition to routine retests, take 50 colonies and 1 gross streak of H149 (419-2-1) and streak out on EM3Lac.

H148 = 419-2-2 LacEM3B: Many +; occ. - and V.

H150 = 3 Mostly +; occ V and -

151 = 4 Mostly - occ V and +

152 = 5 " " "

153 = 6 Ca = +, -

Store
20 m
EMS-Lac
T1
plate
Work up
5 add'l

W589 x W477

419a.

1/25/49.

Series (D). 22-25. ^{W589 x W477}

EMB Lac:

22: Most colonies either large, rough spreading hact or. small, smooth hact - , with some more compactations. 1? still unaged colony.
^{not sharp}

48+: 10 - 102 2 v.

H 154

23: Majority -. 44-: 17+. 102 2 v. H 155

24: 20+: 11+ H 156

25: 54+: 27- H 157

A 25. None of these seem to be strictly mendelian. The colonies which are probably unaged are not very sharply defined, and some of them may represent the slow fermentation type of W589. At any rate these do seem to be heterozygotes. Wait for EMB plates to develop before proceeding.

Add in'l 108 colonies picked and tested on Lac EMB. + agar.

W1477 x Y-161.

4196.

(H149 segregations, etc.).

Jan 25, 1949

Find. colonies of "H149" had been streaked out on EMB lac.

1. Only + and V? or lighter colonies noted.
2. +, vague + or V, and a few - .
3. + only. Probably mis-scored as "mosaic".
4. Mostly "mosaic"; few, = + and - .
5. Mostly +, spreading. A few -
6. All +
7. All +
8. + = -. A few mosaic.

o (gross streak). + sl. > - . Recover H149 to ETYS from
8 to avoid possibility of losing this strain.

Conjugenda !

419+

January 25, 1979.

A considerable part of the work done this day used contaminated tubes for suspending colonies, etc.

Following can be recovered from original plates:

- ① Resolution of H148-153 (lac⁺- from Y-161 x WY77)
T.O. H149 [too much trouble]
- ② 417-7 (H147) from EMS Xyl plate.
- ③ H138 M+ from EMS Mal.

Repeat: H144 on Htl

January 23, 1949.

1. W126 x W701 Lac₋ x Lac₋ Met₋ Gal₋ Ar₋
2. W589 x W677 Tr₋ Ad₋ x F₆ -.

Yields poor on ①. v. few + as expected. high on ②.

(2). 100 picked P25. A26. No clearly segregating colonies.
 streaked on Lac EMB (N2)

8 picked. Show peculiar mottled appearance on Lac E1413 (Is this another
 lac-epoxates?)

After 36-40 hours, on Lac EMB, these colonies (7 of the 8) show definite
 sectoring, especially #6. Assign H159-164 to these
 cultures. streak out mosaics of H163 (#6).

(2). Additional 100 picked P26. A27: very questionable ±.
 streak out on EMB; EMS as 420-2-1 Not variegated

∴ "2" has given no reasonable heterozygotes.

Jan 26, 1948.

S.O. H139 and H141 on EMS Mtl, Mal and EMB Lac to select reveresens.

On EMS Mtl, H141 shows pied +, a few - colonies. At this time is Mtl ±.

To confirm, streak out on EMS Lac, EMB Lac + EMB Mtl

H139 OK.

P30. 16 papillae from H139 picked to Mtl EMS (or EMB). Later + more
P1 Restreak on EMS Mtl; EMB Lac and EMB Mtl.

| | Lac EMB |
|----|---------|
| 1 | ✓ |
| 2 | ✓ |
| 3 | ✓ |
| 4 | ✓ |
| 5 | ✓ |
| 6 | ✓ |
| 7 | ✓ |
| 8 | ✓ |
| 9 | ✓ |
| 10 | ✓ |
| 11 | ✓ |
| 12 | ✓ |
| 13 | ✓ |
| 14 | ✓ |
| 15 | ✓ |
| 16 | ✓ |
| 17 | ✓ |
| 18 | ✓(?) |
| 19 | ✓ |
| 20 | ✓ |

All the cultures are obviously still bac v.

On mannitol, however, they show an indefinite reaction never fully +, rather gummy, and sometimes against a vaguely colored background. Pick the most clearly colored colony in each set and streak on Mtl EMB.

On EMS Mtl, similarly, the colonies show an intermediate response.
(This may be due to vigorous reduction of H.B.)

Segregation of H163

424.

January 28, 1944

Aftr 18 hr.

- 1) Inoculate from EM8bac to Pinassay. Dilute and spread on various sugar media (Lac, Mal, Gal, Ar EMB. Two sets, A & B)
- 2) Stake out single segregated colonies from EMB Lac to same

| | | | | | | |
|------------------|--------|------|----------|------------------|--|--|
| ① P31 A. LacEMB: | 1) 58- | 1+ | $9 \pm$ | 168. | Lac- off streaks, one pinkish; no blues. | |
| | 2) 76- | 1+ | $9 \pm$ | 186 | | |
| | 3) 76- | 2+ | $14 \pm$ | 192 | | |
| | | 210- | 4+ | $32 \pm$ / 246 Σ | | |

| | | | |
|-----|------|-----|------------------------------|
| Lac | 105+ | 4- | Corrected for heterozygotes. |
| | 109+ | 6- | |
| | 214+ | 10- | / 224. 195 |

| | | | |
|-----|------|------|---------|
| Mal | 151+ | 17- | |
| | 96+ | 5- | |
| | 247+ | 22-7 | 264 234 |

| | | | |
|-----|------|-----|---------|
| Gal | 122+ | 6- | |
| | 73+ | 2- | |
| | 195+ | 8-7 | 203 177 |

| | | | | |
|--------|-----|----|----------|------------------------|
| LacEMB | 75- | 1+ | $11 \pm$ | Held test for M-(B) on |
| | 90- | 0+ | $8 \pm$ | |

| | | | | |
|---------------------|-----|----|----------|------------------|
| None off | 145 | 1+ | $19 \pm$ | / 165 all media. |
|---------------------|-----|----|----------|------------------|

| | | | |
|-----|------|----|--|
| Gal | 107+ | 5- | |
| | 104+ | 6- | |

In series A, Lac plates show 87.0% segregation. Of the segregants there was: 1.87% Lac+ ; 5.13% Mal- ; 9.4% Gal- ; 4.5% Ar-.

In series B, there was 88.5% segregation.

7/24/11

Pick Lac+ at random and test:

A1.

| | Lac | Mal | Gal | Ar |
|--|-----|-----|-----|----|
|--|-----|-----|-----|----|

| | | | | |
|---|---|---|---|---|
| 1 | - | + | + | + |
| 2 | - | + | + | + |
| 3 | - | + | + | + |
| 4 | - | + | + | + |
| 5 | - | + | - | + |

(1)

| | | | | |
|----|---|---|---|---|
| 6 | + | + | + | + |
| 7 | + | + | + | + |
| 8 | + | + | + | + |
| 9 | + | + | + | + |
| 10 | + | + | + | + |
| 11 | + | + | + | + |
| 12 | + | + | + | + |
| 13 | + | + | + | + |

↓

| | | | | |
|----|---|---|---|---|
| 14 | + | + | + | + |
| 15 | + | + | + | + |
| 16 | + | + | + | + |
| 17 | + | + | + | + |
| 18 | + | + | + | + |
| 19 | + | + | + | + |
| 20 | + | + | + | + |
| 21 | + | + | + | + |
| 22 | + | + | + | + |

↓

| | | | | |
|----|---|---|---|---|
| 23 | + | + | + | + |
| 24 | + | + | + | + |
| 25 | + | + | + | + |
| 26 | + | + | + | + |
| 27 | + | + | + | + |
| 28 | + | + | + | + |
| 29 | + | + | + | + |
| 30 | + | + | + | + |
| 31 | + | + | + | + |
| 32 | + | + | + | + |
| 33 | + | + | + | + |

↓

| | | | | |
|----|---|---|---|---|
| 34 | + | + | + | + |
| 35 | + | + | + | + |
| 36 | + | + | + | + |
| 37 | + | + | + | + |
| 38 | + | + | + | + |
| 39 | + | + | + | + |
| 40 | + | + | + | + |
| 41 | + | + | + | + |

↓

2nd negative

2

3

| | Lac | Mal | Gal | Ar |
|--|-----|-----|-----|----|
|--|-----|-----|-----|----|

| | | | | |
|----|---|---|---|---|
| 42 | + | + | + | + |
| 43 | + | + | + | + |
| 44 | + | + | + | + |
| 45 | + | + | + | + |
| 46 | + | + | + | + |
| 47 | + | + | + | + |
| 48 | + | + | + | + |
| 49 | + | + | + | + |
| 50 | + | + | + | + |

selected strain

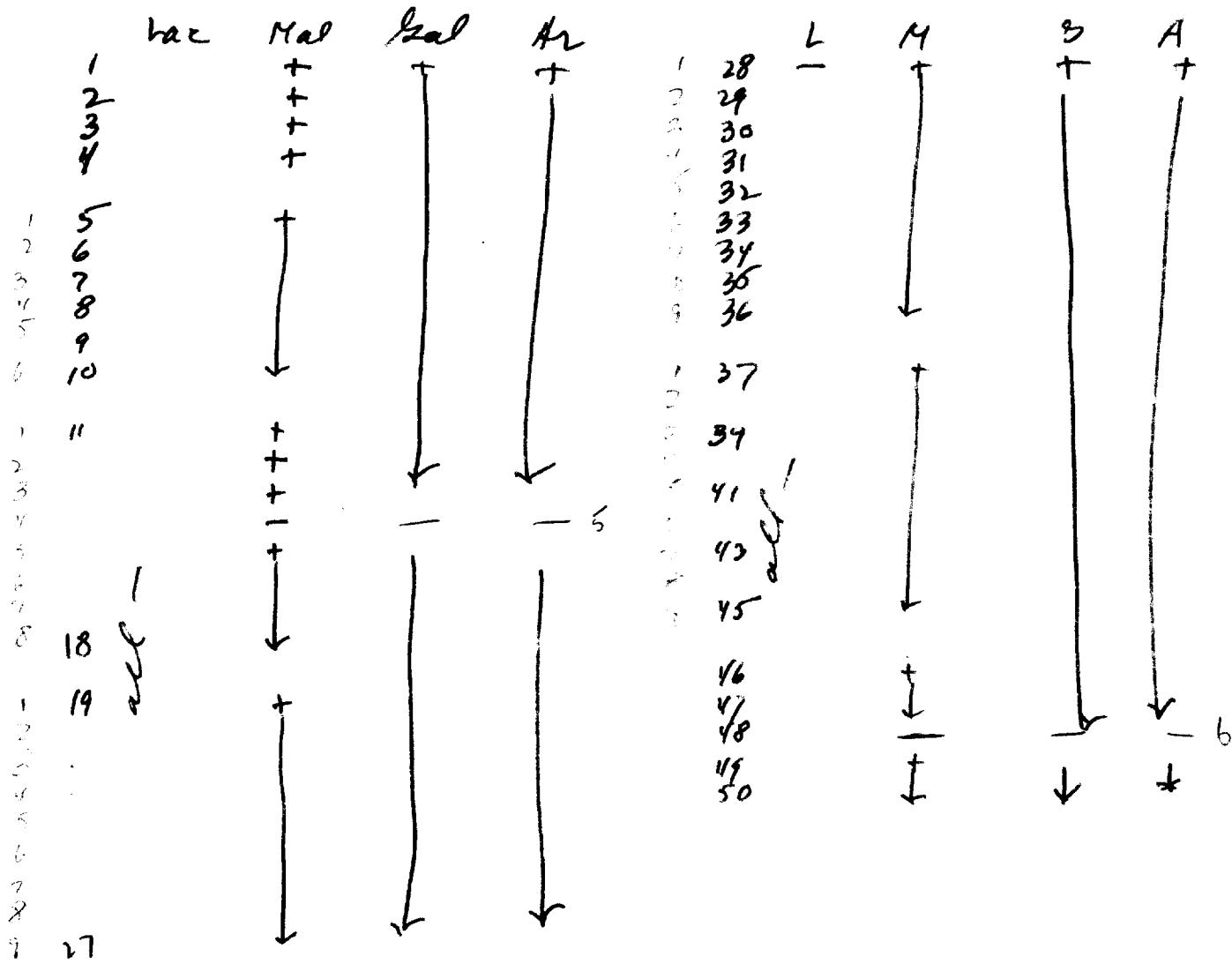
(-?)

↓

| | | | | |
|---|---|---|---|---|
| 1 | + | + | + | + |
| 2 | + | + | + | + |
| 3 | + | + | + | + |
| 4 | + | + | + | + |

↓

A2



For, student "u" is one of the
other organisms.

All - here tested are glucose-negative!

∴ W701 carries such a factor, probably
introduced as Mal-.

Allow above to revert + test reversion's on
Xyf and Ar.

| | Lac | Mal | Gal | Ar. |
|-----|-----|-----|-----|-----|
| B1. | - | + | + | + |

46 tests.

except.

| | | | | |
|---------|---|------|----|---|
| Row B-6 | - | - | 8 | - |
| E 1 | - | - | 9 | - |
| G 2 | - | - | 10 | - |
| A 4 | - | (-?) | 1 | + |

1/17/2

| | | | | |
|----|---|---|---|---|
| B2 | - | + | + | + |
|----|---|---|---|---|

49 tests.

except.

| | | | | |
|-----|-----------|---|---|---|
| A 2 | - | - | - | - |
| A 3 | - | - | - | - |
| B 4 | - | - | - | - |
| B 8 | - | - | - | - |
| C 2 | - | - | - | - |
| E 4 | - | - | - | - |
| E 8 | - | - | - | - |
| A 4 | + in part | + | + | + |

Total: 195 tests of Lac -. 15 were Mal-Gal-Ar -

180 Malt' Gal + Ar +

2 were possibly Mal slow.

Re-test these as 424-1 and 2

Reduce some of the --- on glucose. There may be an yeast-like -

4240.

Feb. 1, 1949.

H163B. Ar-: 11 tested. 10 are Lac- Gal- Ar- Mal- V_i^R

{ #8 is Lac ± Gal + Ar + Mal +. Streaks out on ~~Mal~~ Lac ± 15 mm. Still Lactose neg.

Nutritional tests on 1-7, 9-11.

February 1, 1911.

H 163 A last + : 1-4

| | |
|--------|-------------|
| B | 5 |
| A Mal- | 6-14 |
| B | 15-19 No 20 |
| A Gal- | 21-36 |
| A Ar- | 37-44 |
| B " | 45-46. |

| | Lac | Mal | Gal | Ar | | Lac | Mal | Gal | Ar |
|----|-----|-----|-----|----|--|-----|-----|-----|----|
| 1 | + | + | + | + | | 21 | | | |
| 2 | + | + | + | + | | 22 | | | |
| 3 | + | + | + | + | | 23 | | | |
| 4 | + | + | + | + | | 24 | | | |
| 5 | + | + | + | + | | 25 | | | |
| 6 | | | | | | 26 | | | |
| 7 | | | | | | 27 | | | |
| 8 | | | | | | 28 | | | |
| 9 | | | | | | 29 | | | |
| 10 | | | | | | 30 | | | |
| 11 | | | | | | 31 | | | |
| 12 | | | | | | 32 | | | |
| 13 | | | | | | 33 | | | |
| 14 | | | | | | 34 | | | |
| 15 | | | | | | 35 | | | |
| 16 | | | | | | 36 | | | |
| 17 | | | | | | 37 | | | |
| 18 | | | | | | 38 | | | |
| 19 | | | | | | 39 | | | |
| | | | | | | 40 | | | |

all others -

January 28, 1949

- ① Y10 x W589
- ② W477 x "
- ③ W677 x "

P30-31. (1). + colonies only. 20 picked for retest, all ++ Lac.

(2). 100 picked + streaked on E45 Lac 4002 for retest.

(3) " " . All ++

425-1-2 ~~#~~ on E45 Lac for retest.